Mental Distress: Risk and Protective Factors among American Indian Youth

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Abstract

This study investigates the associations between mental distress of American Indian youth and risk and protective factors. Having at least one lifetime trauma, being bullied by peers, substance abuse, and skipping schools are used as risk factors; and perceived social supports and out-of-school-time activity participation are used as protective factors. Utilizing a survey with 5,714 American Indian students, through logistic regression, findings suggest that risk factors are associated with more mental distress. Students who participate in out-of-school-time activities at least three times a week, and those reporting social supports, particularly family/community support and sense of empowerment, have lower probability of mental distress. Practice and policy implications are discussed.

Background

In Minnesota, there are 864,185 students in public K-12 schools; including 21,027 American Indian students (2.4%; Minnesota Department of Education, 2016a). About 1,000 American Indian students attend Minnesota tribal schools (one of 23 states with Bureau of Indian Education schools). Minnesota has the 9th largest American Indian student enrollment in the country, with about one-third attending Twin Cities' schools.

In 2016, across all grades and accountability tests, 31.8% of Minnesota American Indian students were proficient in mathematics (68.1% for White students), 35.7% were proficient in reading (67.9% for White students), and 26.8% were proficient in science (63.5% for White students). In 2016, the 4-year graduation rate was 52.6% for American Indian students, lower than White (87.0%), Latino (65.3%), and Black (65.1%) students. Minnesota is 48th (out of 50) for the 4-year graduation rate of American Indian students (US Department of Education, 2014).

There is a paucity of research on American Indian students despite increased attention to achievement gaps and educational equity (Demmert, Grissmer, & Towner, 2006). American Indian students in general are underserved (Guillory & Wolverton, 2008), and research regarding their academic and developmental outcomes is limited, either due to consistently small samples (Peng & Wright, 1994; Hughes, Witherspoon, Rivas-Drake, & West-Bey, 2009) or because of the complexity of their racial, ethnic, and tribal characteristics (Demmert, Grissmer, & Towner, 2006; Wall, Garcia-Andrade, Wong, Lau, & Ehlers, 2000). It is critical to improve knowledge regarding American Indian student characteristics and experiences to better meet their needs. Using the 2016 Minnesota Student Survey (MSS), which includes a large sample of American Indian students, this study contributes to the knowledge base by examining American Indian students' developmental supports and challenges, as well as family and social contexts, as they relate to experiencing mental distress, a significant risk factor in American Indian communities. In examining elements of the ecology of youth development and the occurrence of mental distress, we offer a different elucidation of American Indian students' academic journeys.

Perspectives

Mental distress, as measured in the MSS (Rodriguez, 2017), is severe, including having long-term mental health, behavioral, or emotional problems; having been treated for mental

health, emotional, or behavioral problems; having considered or attempted suicide; or purposefully hurting or injuring oneself. About 52% of American Indian students report experiencing mental distress. American Indian youth had the largest proportion with mental distress, compared to other racial/ethnic groups.

Longstanding historical trauma experienced by American Indian communities is posited to be a risk factor that elicits feelings of mental distress (Evans-Campbell, 2008). Across multiple generations, historical trauma (i.e., negative stereotypes, microaggressions, forced relocation, and prohibition of cultural practices) can have lasting impacts on the mental health and well-being of American Indian communities (Brokenleg, 2017).

Potential catalysts for mental distress come from engagement in risky behaviors and traumatic experiences. American Indian youth receiving mental health services revealed high rates of substance use and exposure to domestic violence, family members with substance abuse, criminal activity, or physical abuse at the hands of family members (Dickerson & Johnson, 2012). American Indian youth often face peer victimization (Silmere & Stiffman, 2006), including racism, cultural insensitivity, and stereotypes in combination with feelings of isolation and low self-esteem (as a potential byproduct of the intergenerational and historical trauma). Youth subsequently internalize these feelings, experience depression, or engage in high risk behaviors, such as substance use and gang-related activities (Johnson & Tomren, 1999; Whitbeck, Hoyt, McMorris, Chen, & Stubben, 2001).

At the same time, there are protective factors that may assuage the effects of risk factors and decrease the likelihood of mental distress, such as social supports (and subsequent sense of belonging) and out-of-school-time (OST) activity participation. American Indian students benefit from various types of social supports. Parental support, for instance, is a positive factor in American Indian students' schooling (Okagaki, Helling, & Bingham, 2009). American Indian urban adolescents who have peer support are more resilient (Stumblingbear-Riddle & Romans, 2012). Most importantly, having social support can lower depressive symptoms (Sherman, Skrzypek, Bell, Tatum, & Paskett, 2011) and decrease drug use (Kulis, Napoli, & Marsiglia, 2002). This is premised from belongingness and social connectedness to be important basic human motivations (Baumeister & Leary, 1995), particularly for American Indian youth, where belonging to community is the most significant element of identity (Brendtro, Brokenleg, & Van Bockern, 2002).

Another factor associated with mental distress is family composition. A number of researchers suggest that youth from two-parent households exhibit more positive outcomes than single-parent and extended single-parent families. When controlling for race and ethnicity, students in two-parent households (where in existing research, typically includes mother-father) reported lower levels of substance use than those in single-parent families (Barrett &Turner, 2006). Two-parent families also appear to be most beneficial to academic achievement (Peng & Wright, 1994). In addition, depressive symptoms are associated with low socioeconomic status, problematic family relationships, low family support, and high level of exposure to social stress including traumatic life events (Barrett & Turner, 2006). We have not clearly separated the prevalence of such events from family structures yet, as self-reported family structures are complex in the MSS.

Lastly, OST activity participation is associated with less mental distress. School-organized sports participation was positively associated with developmental skills and social

supports, and negatively associated with developmental challenges, including mental distress (Mason et al., 2009; Kang et al., 2017; Nickodem et al., 2016; Van Boekel et al., 2016). For disadvantaged youths with mental health challenges, higher frequency of OST activity participation was associated with higher interpersonal strengths and lower internalizing problems (Abraczinskas et al., 2016).

With this in mind, we examine the associations among mental distress, risk factors, social supports, and OST activity participation for American Indian students.

Research Questions

1. To what extent are demographics, family composition, risk factors and risky behaviors associated with American Indian students' mental distress?
2. To what extent are developmental supports associated with American Indian Students' mental distress (and after accounting for personal and family characteristics)?
3. To what extent is level of OST activity participation associated with American Indian students' reported mental distress (and after accounting for personal and family characteristics)?

Methods

Instrument

The data come from the 2016 MSS (Minnesota Department of Education, 2016b). The MSS was designed by the Departments of Education, Health, Human Services, and Public Safety, and administered every three years to 5th, 8th, 9th, and 11th grade students from public schools. The purpose of the survey is to monitor important trends in students' habits, experiences, and beliefs about positive and risky behaviors. The MSS Interagency Team provided the researchers full access to the survey database to perform secondary data analyses, as part of a larger program of research investigating the ecologies of positive youth development (Minnesota Youth Development Research Group, 2018), with review by their institutional review board.

Participants

The data include 5,714 American Indian students in grades 8, 9, and 11, with 50% male. Just over 51% of American Indian students report having some level of mental distress. More information regarding participants is displayed in Table 1.

Statistical Analysis

We employ logistic regression to estimate the odd ratios of having mental distress as a function of student characteristics, family structures, risk factors and risky behaviors, developmental social support, and OST activity participation. Mental distress is coded as binary, and serves as an indicator of any mental distress as described above. Since the outcome measure is dichotomized, in logistic regression the regression coefficient (b) is the estimated change in the log-odds of the dependent variable, when one-unit change occurs in the value of the independent variable (Szumilas, 2010). The exponential function of the regression coefficients (e^b) corresponds to the odds ratio of having the characteristic specified in the dependent variable.

Odds ratios (OR) provide relative odds of occurrence of a characteristics given in the dependent variable. In the current study, mental distress is coded as 1 and 0, such that a value of

1 corresponds to having mental distress. Accordingly, in the current study, the odds ratio equals the ratio of having mental distress to not having mental distress, conditioned on an independent variable, or when controlling others. For interpretation:

OR = 1 suggests there is no association between independent variable and odds of having mental distress;

OR > 1 suggests an increase in a given independent variable is associated with higher odds of having mental distress;

OR < 1 suggests an increase in a given independent variable is associated with lower odds of having mental distress.

To answer the three research questions, sixteen logistic regression models were fit. For each model, odds ratios (OR) and 95% confidence intervals are provided.

We also computed McFadden's Pseudo-R^2 for each model. In regression models fitted based on ordinary least squares (OLS), R^2 measure is provided to demonstrate how much variance is explained by the model in the dependent variable. However, since logistic regression models are estimated based on maximum likelihood estimation, such a measure does not exist. Therefore, various methods have been developed for logistic regression, so that they can be interpreted as R^2, including McFadden's Pseudo-R^2.

Measures

Student characteristics include sex (Female), free/reduced priced lunch (FRPL), at least one traumatic experience (trauma), substance use (including any cigarette, alcohol, marijuana, and other drug use), and skipping school or class. Family structure is based on the students' responses to the question "Which adults do you live with?", including nine categories: extended families, single-parent families, extended single-parent families, blended families, living with sometimes mother and sometimes father, foster parents, and other types of families or adults; two-parent families is the reference group (more information is given in Appendix B). Racial variation is grouped into five categories with American Indian only as the reference group: American Indian and White mix, American Indian and Black mix, American Indian with other race/ethnicities (Hispanic/Latino, Somali, Hmong, Asian, and Pacific Islander) and American Indian with multiple race/ethnicities. OST activity participation has three levels, including one-time/week, two-times/week, and three-times/week or more (no participation is the reference group).

Age is continuous variable and ranges between 12 and 19 (M=14.7, SD=1.26). Family/community support (FCS), Empowerment (EM, based on the measure of EM from the Search Institute (2013) Developmental Asset Profile), Teacher/school support (TSS) are included as measures of continuous social supports. Being bullied by peers (BD) is a continuous risk factor. Indicators of these measures are given in Appendix A.

Two primary sources of validity evidence include content-related evidence (documented in Benson, 1990, 2002; Benson et al., 2006; and Search Institute, 2013) and internal-structure or construct-related evidence (documented in the MSS Technical Report, Rodriguez, 2017). To support construct-related inferences, the internal structure of the measures were evaluated through confirmatory factor analysis (CFA; using Mplus v. 7; Muthén & Muthén, 2012) and differential item functioning analyses by race/ethnicity, gender, and grade (using Winsteps v.

3.92; Linacre, 2016; with results summarized in Rodriguez, 2017). We followed common guideline for adequate fit indices where RMSEA is below than .10, CFI and TLI are greater than .90 (Brown, 2015; Kline, 2011), and standardized factor loadings are .40 or higher (Brown, 2015); although we note that in many factor analytic studies of research surveys, standardized factor loadings of .30 are often used to define salient loadings.

A three-factor CFA was fit to the data for the three measures of developmental supports (FCS, EM, TSS). The global fit indices indicate nearly adequate fit, where RMSEA is .13, CFI is .89, and TLI is .87. The model fit indices for each developmental support as a separate measure also were estimated. For FCS, RMSEA is .13, CFI is .98, TLI is .95; for EM, RMSEA is .23, CFI is .91, and TLI is .85; and for TSS, RMSEA is .13, CFI is .98, and TLI is .97. In the three-factor CFA, the standardized factor loadings ranged from .53 to .91. Overall, these fit indices, and particularly the factor loadings, support the use of these items as indicators of development support measures. Moreover, since the measures are not used at the individual level, they provide strong indicators of developmental supports at the group level, the intended level of analyses. The disattenuated correlations among the three developmental supports are moderate; the correlations of FCS with EM is .77, TSS with EM is .63, and TSS with FCS is .73.

The measures were then scored using the partial credit Rasch model in Winsteps 3.92 (Linacre, 2016). The partial credit Rasch model allows each item to have its own structure (given the ordinal nature of the response scales) and places persons and items onto the same scale. The Rasch reliabilities of these measures were also adequate: EM (.72), FCS (.71), and TSS (.85).

Results

Models 1-5 (Table 2) correspond to the first research question. Regarding demographic variables, age (OR = 1.11), FRPL (OR = 1.52), and identifying as female (OR = 2.37) are positively associated with higher odds-ratio of mental distress (Model 1). Furthermore students who self-identified as American Indian with White mix (OR = 1.33) or American Indian with multiple race/ethnic combination (OR = 1.31) also have higher odds-ratio of mental distress than students who identify as American Indian only, the reference group. Conversely students who identified as American Indian with other race/ethnicities have lower odds-ratio of mental distress (OR = .70). There was no significant difference for students from American Indian with Black mix background.

Model 2 indicates that the odds-ratio of having mental distress are higher for each family composition compared to students living in two-parent family households. Additionally, Models 3 and 4 show that both risk factors (experiencing trauma and being bullied) and risky behaviors (substance use and skipping school) respectively are associated with higher odds-ratio of having mental distress. When controlling for background characteristics in conjunction (Model 5), however, FRPL (OR = 1.06), American Indian with other race/ethnicities (OR = .85), and extended single-parent family structure (OR = 1.44) are no longer significant.

Models 6-10 (Table 3) correspond to the second research question. Regarding social supports, Model 6 indicates that FCS and EM are associated with lower odds-ratios of mental distress. However, there was no significant difference for TSS. Models 7-9 include social supports as background control variables to further examine the association between demographic variables and mental distress. When controlling for background characteristics in

conjunction (Model 10), TSS becomes significant, where students who report receiving TSS have higher odds-ratio of mental distress (OR = 1.11). Additionally, grandparents/relatives family structure (OR = 1.31) and marijuana use as a risky behavior (OR = 1.20) are no longer significant.

Models 11-16 (Table 4) correspond to the third research question. The threshold of at least three times/week OST activity participation is associated with lower odds-ratio of having mental distress without accounting for other variables in Model 11 (OR: 0.61), as well as when accounting for other variables in Model 16 (OR: 0.74). Composite Model 16 indicates that when controlling for all background characteristics relevant to this study, the trends remain in the same direction similar to composite Models 5 and 10.

Discussion and Significance

Our first research question explores the association between American Indian students' demographics, family composition, risk factors, and risky behaviors. We found a positive association between age and likelihood of mental distress. However, FRPL, after controlling for background characteristics, is not associated with mental distress. The odds-ratio of having mental distress is also approximately two-times greater for female students than male students in all sixteen models. Risk factors, particularly trauma, are significantly related to higher odds-ratio of mental distress. Risky behaviors, encompassed by substance use and skipping school, are also related to higher odds-ratios of mental distress; likely the result of mental distress.

Additionally, students who self-identify as American Indian with White mix and American Indian with multiple race/ethnic combinations have higher odds-ratio of mental distress than students who identify as American Indian only (reference group); although students identifying as American Indian (regardless of other race/ethnicities) do report higher levels of mental distress than students who do not identify as American Indian. This increased likelihood of mental distress among these groups reflect, potentially, a history of trauma, colonization, and assimilation. That is, this history may impact how these students perceive how they belong (Baumeister & Leary, 1995), or not belong, to their educational and social environments, as one example, that subsequently contributes to their likelihood of mental distress. The complexity introduced by multi-racial American Indian students and American Indian-White mix likely indicate the struggles facing students with multiracial backgrounds that may present incompatible ways of knowing or ways of being, greater exclusion or isolation, and unique forms of discrimination (Sanchez, 2010; Shih & Sanchez, 2005). However, empirical research on multiracial American Indian youth is sparse.

Family composition appears also to be associated with mental distress, where living in two-parent family households appear to be protective. However, our findings suggest that after considering protective factors, specifically social supports, American Indian students who live with grandparents/relatives or extended single parent family compositions are not significantly different than those who live in two-parent family households in terms of the likelihood of mental distress. This finding is important and could be a warning that a mediation effect of social support might be present for some family structures.

Our second research question explores the extent to which different kinds of social supports are associated with American Indian students' mental distress. Social supports,

particularly family/community support and sense of empowerment, appear to play a role in lower likelihoods of mental distress. This is intuitive, particularly for students from American Indian backgrounds. However, teacher school support, as indicated in the composite Model 10, counterintuitively predicts a higher odds-ratio of mental distress. We consider two possible explanations for this result. The first is that because the three social support criteria are related, that the benefits of TSS may already be captured in the other two constructs, FCS and EM. The second explanation adds on to the first in that, the association between mental distress and TSS may be bi-directional. It could be that American Indian students who have a higher likelihood of mental distress also require more TSS. This finding is important and could serve to highlight the discrepancies between the various sources of social support.

Lastly, our third research question explores the association between levels of OST activity participation with American Indian students' reported mental distress. Across the thresholds of OST activity participation, participating for three days or more per week is associated with a lower likelihood of mental distress. This finding builds on previous literature suggesting that high frequencies of extracurricular activity participation is associated with lower levels of substance use among American Indian youths (Moilanen et al., 2014). Thus, this study provides another perspective into the benefits of OST activity participation, especially among American Indian students.

As this study is exploratory, there are limitations. The first is sample size. Some groups had fewer students, relative to the total sample of American Indian students in the MSS. For example, there was no significant association between mental distress and American Indian with Black mix students across our sixteen models. We posit that this may be due to their relatively smaller sample size compared to the number of students in the other groups. However, this non-association may also suggest that there may be something else not captured in this analysis. For instance, there may be a differential threshold for students whose bi-cultural identities are both stigmatized compared to students with only one stigmatized identity. The second limitation concerns the complexity of coding students' responses within the question constraints. The family composition question, for example, asked "Which adults do you live with?", and students could select more than one option. This, however, made coding and aggregating the variables complex, and their given responses may only reflect the specific time point when they responded to the survey. Future research will seek to address these shortcomings.

These findings can inform the public education and counseling sectors, and should inform further research in the area of American Indian mental health. As our study suggests, data on American Indian students are complex, which begets the need to expand on and increase research activities on this student population. We found that bivariate associations and correlations are insufficient and do not paint the whole picture. Risk factors and risky behaviors, for example, among other factors, can contribute to and may moderate the likelihood of mental distress across American Indian student groups. Educators and counselors can use this information to structure their curriculum or therapy practices, respectively, to better support the needs of these students, specifically through better understanding the sources that contribute to students' elevated mental distress levels.

We also found that social supports do contribute to the decreased likelihood of mental distress among American Indian students, particularly family community support and empowerment. Finally, contrary to previous literature, we found that students who reported living in extended single parent family structure or grandparents/relatives family structure do not

differ significantly from students who reported two-parent family households on the likelihood of mental distress. These findings can equip practitioners with the knowledge, skills, and tools to further support American Indian students, specifically, through a better understanding of which social supports are at play and the importance of context, such as home and school environments. In conclusion, this exploratory study found that American Indian students' likelihood of mental distress is associated with certain demographic variables, family compositions, risk factors and risky behaviors, and social supports and OST activity participation, and can inform policy makers and practitioners on the mental health needs of American Indian students.

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Tables

Table 1 *Means or Frequencies for Predictor Variables as a Function of Gender*

Variables	Female (n = 2864)				Male (n = 2850)				Total (n = 5714)			
	M	SD	n	%	M	SD	n	%	M	SD	n	%
Mental distress			1774	62			1159	41			2933	51
Demographic												
Age									14.7	1.26		
FRPL			1483	52			1341	47			2824	49
Race/ethnic background												
AI/only(reference)			540	19			544	19			1084	19
AI/white			1331	47			1422	50			2753	48
AI/black			123	4			97	3			220	4
AI/other			293	10			251	9			544	10
AI/multi			577	20			536	19			1113	19
Family Structure												
Two-parents (reference)			1126	39			1247	44			2373	42
Extended families			60	2			41	2			101	2
Single-parent			522	18			511	18			1033	18
Extended single-parent			65	2			66	2			131	2
Blended			597	21			527	18			1124	19
Sometimes father/mother			273	10			248	9			521	9
Grandparents/relatives			115	4			101	4			216	4
Foster			58	2			40	1			98	2
Other			48	2			69	2			117	2
Risk Factors												
Trauma			1849	65			1623	57			3472	61
Being Bullied	7.67	1.40			7.13	1.42			7.42	1.44		
Risky behaviors												
Cigarette			346	12			253	9			599	10
Alcohol			616	22			461	16			1077	19
Marijuana			495	17			412	14			907	16
Drug			285	10			190	7			475	8
Skip school or class			903	32			818	29			1721	30
Social Support												
Family/community support	11.47	1.72			11.87	1.78			11.7	1.76		
Empowerment	11.60	1.85			12.08	1.86			11.85	1.87		
Teacher/school support	10.86	2.14			11.47	2.25			11.17	2.21		
Activity Participation												
0 day/week (reference)			903	32			958	34			1861	32
1 day/week			225	8			153	5			378	7
2 days/week			208	7			178	6			386	7
3 days or more/week			1528	53			1561	55			3089	54

Table 2 *Logistic Regression Results Predicting Mental Distress (Model 1 – Model 5)*

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.
Intercept	0.11***	[0.06, 0.21]	0.70***	[0.65, 0.76]	0.01***	[0.01, 0.02]	0.71***	[0.66, 0.76]	0.00***	[0.00, 0.00]
Demographic										
Female	2.37***	[2.13, 2.64]							1.98***	[1.75, 2.23]
Age	1.11***	[1.06, 1.15]							1.11***	[1.05, 1.16]
FRPL	1.52***	[1.36, 1.70]							1.06	[0.93, 1.21]
AI/white	1.33***	[1.15, 1.54]							1.49***	[1.26, 1.77]
AI/black	0.98	[0.73, 1.32]							1.09	[0.79, 1.52]
AI/other	0.70**	[0.56, 0.87]							0.85	[0.67, 1.08]
AI/multi	1.31**	[1.10, 1.56]							1.33**	[1.09, 1.62]
Family Structure										
Extended families			2.47***	[1.64, 3.76]					2.19**	[1.37, 3.54]
Single-parent			1.72***	[1.49, 2.00]					1.38***	[1.16, 1.64]
Extended single-parent			1.91***	[1.34, 2.74]					1.44	[0.95, 2.18]
Blended			2.18***	[1.88, 2.52]					1.56***	[1.32, 1.85]
Sometimes father/mother			1.76***	[1.46, 2.14]					1.48***	[1.19, 1.85]
Grandparents/relatives			2.63***	[1.97, 3.53]					1.65**	[1.18, 2.32]
Foster			3.75***	[2.42, 5.98]					2.61***	[1.59, 4.39]
Other			2.37***	[1.62, 3.49]					1.90**	[1.22, 2.98]
Risk Factors										
Trauma					2.81***	[2.50, 3.17]			2.20***	[1.93, 2.51]
Being Bullied					1.64***	[1.57, 1.71]			1.56***	[1.49, 1.63]
Risky behaviors										
Cigarette							2.70***	[2.12, 3.46]	2.09***	[1.61, 2.74]
Alcohol							1.63***	[1.38, 1.93]	1.33**	[1.10, 1.61]
Marijuana							1.35**	[1.11, 1.63]	1.28*	[1.04, 1.58]
Drug							2.61***	[2.03, 3.39]	1.95***	[1.49, 2.59]
Skip school or class							1.50***	[1.33, 1.70]	1.28***	[1.11, 1.48]
Pseudo R^2	**0.05**		**0.03**		**0.14**		**0.07**		**0.20**	

Note. McFadden Pseudo R^2 is used. *ρ< .05. **ρ< .01. ***ρ< .001

Table 3 *Logistic Regression Results Predicting Mental Distress (Model 6 – Model 10)*

Variables	Model 6		Model 7		Model 8		Model 9		Model 10	
	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.
Intercept	665.51***	[417, 1070]	74.71***	[31.8, 176]	50.67***	[21.2, 121]	0.14***	[21.2, 121]	0.18**	[0.06, 0.55]
Social supports										
Family/community support	0.76***	[0.73, 0.80]	0.76***	[0.73, 0.80]	0.78***	[0.74, 0.81]	0.83***	[0.74, 0.81]	0.83***	[0.79, 0.87]
Empowerment	0.74***	[0.71, 0.78]	0.74***	[0.71, 0.78]	0.75***	[0.71, 0.78]	0.79***	[0.71, 0.78]	0.80***	[0.76, 0.84]
Teacher/school support	1.02	[0.99, 1.05]	1.04*	[1.01, 1.08]	1.04*	[1.00, 1.07]	1.07***	[1.00, 1.07]	1.11***	[1.07, 1.15]
Demographic										
Female			2.17***	[1.94, 2.44]	2.17***	[1.93, 2.44]	1.96***	[1.93, 2.44]	1.96***	[1.73, 2.21]
Age			1.09***	[1.04, 1.14]	1.08***	[1.04, 1.14]	1.15***	[1.04, 1.14]	1.09***	[1.04, 1.15]
FRPL			1.24***	[1.10, 1.40]	1.11	[0.98, 1.26]	1.04	[0.98, 1.26]	0.01	[0.88, 1.15]
AI/white			1.49***	[1.27, 1.74]	1.55***	[1.31, 1.82]	1.49***	[1.31, 1.82]	1.56***	[1.31, 1.86]
AI/black			1.13	[0.82, 1.55]	1.15	[0.84, 1.58]	1.12	[0.84, 1.58]	1.20	[0.86, 1.67]
AI/other			0.72**	[0.57, 0.91]	0.76*	[0.61, 0.96]	0.79	[0.61, 0.96]	0.84	[0.65, 1.07]
AI/multi			1.43***	[1.19, 1.73]	1.46***	[1.21, 1.77]	1.34**	[1.21, 1.77]	1.42***	[1.16, 1.74]
Family Structure										
Extended families					2.18***	[1.39, 3.46]	2.25***	[1.39, 3.46]	2.13**	[1.32, 3.48]
Single-parent					1.36***	[1.15, 1.61]	1.31**	[1.15, 1.61]	1.28**	[1.07, 1.53]
Extended single-parent					1.47	[0.99, 2.20]	1.36	[0.99, 2.20]	1.33	[0.87, 2.03]
Blended					1.65***	[1.40, 1.94]	1.48***	[1.40, 1.94]	1.46***	[1.23, 1.74]
Sometimes father/mother					1.35**	[1.09, 1.67]	1.31*	[1.09, 1.67]	1.31*	[1.04, 1.64]
Grandparents/relatives					1.62**	[1.17, 2.24]	1.43*	[1.17, 2.24]	1.31	[0.93, 1.86]
Foster					2.84***	[1.75, 4.74]	2.44***	[1.75, 4.74]	2.30**	[1.39, 3.90]
Other					1.93**	[1.25, 3.00]	1.73*	[1.25, 3.00]	1.61*	[1.02, 2.57]
Risk Factors										
Trauma							2.00***	[1.25, 3.00]	1.81***	[1.58, 2.07]
Being Bullied							1.47***	[1.25, 3.00]	1.44***	[1.38, 1.51]
Risky behaviors										
Cigarette									2.03***	[1.55, 2.68]
Alcohol									1.36**	[1.12, 1.65]
Marijuana									1.20	[0.97, 1.49]
Drug									1.85***	[1.40, 2.46]
Skip school or class									1.21**	[1.05, 1.40]
Pseudo R^2	**0.12**		**0.15**		**0.16**		**0.21**		**0.23**	

Note. McFadden Pseudo R^2 is used. *ρ< .05. **ρ< .01. ***ρ< .001

Table 4 *Logistic Regression Results Predicting Mental Distress (Model 11 – Model 16)*

Variables	Model 11		Model 12		Model 13		Model 14		Model 15		Model 16	
	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.
Intercept	1.40***	[1.28, 1.53]	0.18***	[0.09, 0.35]	0.13***	[0.07, 0.26]	0.00***	[0.0, 0.0]	0.00***	[0.0, 0.0]	0.17**	[0.06, 0.53]
Social Support												
Family/community support											0.84***	[0.80, 0.88]
Empowerment											0.81***	[0.77, 0.85]
Teacher/school support											1.11***	[1.07, 1.15]
Activity Participation												
1 day/week	0.96	[0.77, 1.21]	0.89	[0.70, 1.12]	0.88	[0.70, 1.11]	0.79	[0.61, 1.01]	0.81	[0.63, 1.05]	0.86	[0.66, 1.12]
2 days/week	0.84	[0.68, 1.05]	0.81	[0.64, 1.01]	0.83	[0.66, 1.04]	0.75*	[0.59, 0.96]	0.77*	[0.60, 0.99]	0.85	[0.65, 1.10]
3 days or more/week	0.61***	[0.54, 0.69]	0.60***	[0.53, 0.68]	0.64***	[0.56, 0.72]	0.58***	[0.50, 0.66]	0.61***	[0.53, 0.70]	0.74***	[0.64, 0.85]
Demographic												
Female			2.39***	[2.14, 2.67]	2.39***	[2.14, 2.66]	2.00***	[1.77, 2.25]	1.99***	[1.76, 2.25]	1.98***	[1.75, 2.24]
Age			1.09***	[1.05, 1.14]	1.09***	[1.04, 1.14]	1.17***	[1.11, 1.22]	1.10***	[1.04, 1.15]	1.09**	[1.03, 1.14]
FRPL			1.43***	[1.28, 1.60]	1.21**	[1.07, 1.36]	1.05	[0.92, 1.19]	1.02	[0.89, 1.16]	0.98	[0.86, 1.13]
AI/white			1.38***	[1.19, 1.60]	1.46***	[1.25, 1.71]	1.43***	[1.21, 1.69]	1.52***	[1.28, 1.80]	1.57***	[1.32, 1.87]
AI/black			1.00	[0.74, 1.36]	1.03	[0.76, 1.40]	1.03	[0.75, 1.43]	1.11	[0.79, 1.54]	1.20	[0.60, 0.99]
AI/other			0.68**	[0.55, 0.84]	0.74**	[0.59, 0.92]	0.76*	[0.60, 0.96]	0.82	[0.64, 1.05]	0.82	[0.86, 1.68]
AI/multi			1.35***	[1.13, 1.60]	1.39***	[1.16, 1.66]	1.27*	[1.05, 1.54]	1.35**	[1.11, 1.64]	1.42***	[0.64, 1.05]
Family Structure												
Extended families					2.21***	[1.45, 3.41]	2.22***	[1.40, 3.56]	2.11**	[1.32, 3.42]	2.09**	[1.29, 3.42]
Single-parent					1.59***	[1.35, 1.86]	1.37***	[1.15, 1.63]	1.32**	[1.10, 1.57]	1.25*	[1.04, 1.50]
Extended single-parent					1.79**	[1.23, 2.62]	1.45	[0.96, 2.18]	1.40	[0.92, 2.13]	1.31	[0.86, 2.01]
Blended					1.94***	[1.66, 2.26]	1.55***	[1.31, 1.83]	1.52***	[1.28, 1.80]	1.44***	[1.21, 1.72]
Sometimes father/mother					1.62***	[1.33, 1.98]	1.46***	[1.18, 1.82]	1.46***	[1.17, 1.82]	1.30*	[1.04, 1.63]
Grandparents/ relatives					2.40***	[1.77, 3.28]	1.74**	[1.25, 2.43]	1.56**	[1.12, 2.20]	1.28	[0.91, 1.82]
Foster					3.36***	[2.12, 5.47]	2.65***	[1.61, 4.46]	2.50***	[1.52, 4.22]	2.26**	[1.36, 3.84]
Other					2.68***	[1.81, 4.02]	2.06**	[1.34, 3.21]	1.88**	[1.21, 2.95]	1.61*	[1.01, 2.57]
Risk Factors												
Trauma							2.46***	[2.17, 2.80]	2.16***	[1.89, 2.46]	1.81***	[1.58, 2.07]
Being Bullied							1.64***	[1.57, 1.72]	1.58***	[1.51, 1.66]	1.46***	[1.40, 1.54]
Risky behaviors												
Cigarette									2.01***	[1.54, 2.64]	1.99***	[1.52, 2.62]

Alcohol						1.34**	[1.11, 1.62]	1.36**	[1.12, 1.66]
Marijuana						1.24*	[1.01, 1.53]	1.18	[0.95, 1.47]
Drug						1.94***	[1.48, 2.58]	1.85***	[1.40, 2.47]
Skip school or class						1.27***	[1.11, 1.47]	1.21**	[1.05, 1.41]
Pseudo R^2	**0.01**		**0.06**	**0.07**	**0.18**	**0.20**		**0.23**	

Note. McFadden Pseudo R^2 is used. *ρ< .05. **ρ< .01. ***ρ< .001

Appendix A

Indicators of Social Supports Measures

Family/Community Support
Can you talk to your mother about problems you are having? (reversed)
Your parents care about you.
Other adult relatives care about you.
Friends care about you.
Adults in your community care about you.
Empowerment
I feel safe at school.
I feel safe in my neighborhood.
I feel safe at home.
I feel valued and appreciated by others.
I am included in family tasks and decisions.
I am given useful roles and responsibilities.
Teacher/School Support
Overall, adults at my school treat students fairly.
Adults at my school listen to the students.
The school rules are fair.
At my school. Teachers care about students.
Most teachers at my school are interested in me as a person.
Teachers/other adults at school care about you.

Appendix B

Family Structures and Members

Family Structures	Family Members
Two-parent families	Living with two biological father and mother or living with two adoptive father and mother
Extended families	Living with two-parent families and grandparents or relatives
Single-parent families	Living with single biological/adoptive father or mother
Extended single-parent families	Living with single biological/adoptive father or mother, and grandparents or relatives
Sometimes mother sometimes father	Living sometimes mother, sometimes father
Grandparents/ relatives	Living only with grandparents or relatives, and no parents are available.
Blended families	One of the parent is biological/adoptive, the other parent is step parent.
Foster parents	Currently living with foster parents, however other parents may be available.
Other/unknown	Living with alone, or/and living with adults not related to.